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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/471,160	12/23/99	KOKUBO	S 35.C14155

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EXAMINER	
MARKHAM, W	
ART UNIT	PAPER NUMBER
1762	6

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Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary	Application No. 09/471,160	Applicant(s) KOKUBO ET AL.	
	Examiner Wesley D Markham	Art Unit 1762	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-5* is/are pending in the application.

4a) Of the above claim(s) *3 and 5* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2 and 4* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☒ Claims *1-5* are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *23 December 1999* is/are objected to by the Examiner.

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

15) ☒ Notice of References Cited (PTO-892)
16) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
17) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
18) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
19) ☐ Notice of Informal Patent Application (PTO-152)
20) ☐ Other: .

DETAILED ACTION

Election/Restrictions

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:

   I. Claims 1 – 2 and 4, drawn to a coating method and a method of manufacturing a color filter using the coating method, classified in class 427, subclass 424.

   II. Claim 3, drawn to a coating apparatus, classified in class 118, subclass 300

   III. Claim 5, drawn to a liquid crystal display device, classified in class 349, subclass 106.

The inventions are distinct, each from the other because of the following reasons:

2. Inventions I and II are related as process and apparatus for its practice, respectively. The inventions are distinct if it can be shown that either: (1) the process as claimed can be practiced by another materially different apparatus or by hand, or (2) the apparatus as claimed can be used to practice another and materially different process. (MPEP § 806.05(e)). In this case, the apparatus as claimed can be used to practice another and materially different process, such as a coating process that does not involve relatively moving the coating head and the member to be coated.

3. Inventions I and III are related as process of making and product made, respectively. The inventions are distinct if either or both of the following can be shown:

(1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case, the process as claimed can be used to make other and materially different products, such as a color filter instead of a liquid crystal display device.

4. Inventions II and III are related as apparatus and product made, respectively. The inventions in this relationship are distinct if either or both of the following can be shown: (1) that the apparatus as claimed is not an obvious apparatus for making the product and the apparatus can be used for making a different product or (2) that the product as claimed can be made by another and materially different apparatus (MPEP § 806.05(g)). In this case, the product as claimed can be made by another and materially different apparatus, such as an apparatus comprising a moving coating head and a moving stage for holding a member to be coated.

5. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

6. During a telephone conversation with Mr. Lawrence S. Perry of Fitzpatrick, Cella, Harper, & Scinto on March 26, 2001, a provisional election was made without traverse to prosecute the invention of Group I, claims 1 – 2 and 4. Affirmation of this election must be made by applicant in replying to this Office action. Claims 3 and 5 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

7. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a petition under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Drawings

8. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference sign(s) not mentioned in the description: Reference number "66" is present in Figure 3 but is not described in the specification.

9. Applicant is required to submit a proposed drawing correction in reply to this Office action. However, formal correction of the noted defect can be deferred until the application is allowed by the examiner.

Specification

10. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

11. The following title is suggested: "Slit Coating Method, Coating Device, Method of Manufacturing a Color Filter Substrate Using the Same Slit Coating Method, and Liquid Crystal Display Device Using the Color Filter Substrate Manufactured by the Same Manufacturing Method."

12. The abstract of the disclosure is objected to because the phrase, "In a method for coating a member with a coating liquid during moving relatively a coating head and the member often ejecting the coating liquid over a surface of the member..." is confusing. It is not clear whether the coating liquid is being ejected from the coating head or the member itself. A suggested change is, "In a method for coating a member with a coating liquid while relatively moving a coating head and the member to be coated, the coating head often ejecting the coating liquid over a surface of the member..." Correction is required. See MPEP § 608.01(b).

13. The disclosure is objected to because of the following informalities.

14. The phrase, "In the prior art coating device (slit coater) shown in FIG. 4, it is inevitable to prevent the coating liquid from being solidified at the tip of the coating head 5" is unclear (pg.4, lines 6 – 9). If the applicant's intention is to state that the prior art device has a drawback in that the coating liquid can be undesirably solidified at the tip of the coating head, it is suggested that the applicant change the above phrase to read, "In the prior art coating device (slit coater) shown in FIG. 4, it is difficult to prevent the coating liquid from being solidified at the tip of the coating head 5." Appropriate correction is required.

15. The phrase, "The heat drying treatment (the post-baking) is executed in order to main-cure the black matrix to form the black matrix" is unclear (pg.14, lines 14 – 15). The applicant is asked to explain how the black matrix is different before and after the main-cure step. Appropriate correction is required.

Claim Rejections - 35 USC § 112

16. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

17. Claims 1, 2, and 4 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

18. The limitation, "a step of rinsing said coating head by stopping a supply of the coating liquid to said coating head after ejecting the coating liquid, and making a rinsing liquid flow directly to said coating head or toward said coating head from midway of a coating liquid supply path extending to said coating head" in Claim 1 is not enabled by the specification. Specifically, the applicant describes the embodiments of the invention comprising a method wherein the path for supplying the rinsing liquid is partially or entirely separated from the path for supplying the coating liquid (pg.6, lines 3 – 6). No reference is made to flowing the rinsing liquid from a point midway of a coating liquid supply path extending to a coating head, nor is any advantage to this "midway point" disclosed.

Claim Rejections - 35 USC § 102

19. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

20. Claims 1 and 2 are rejected under 35 U.S.C. 102(a) as being anticipated by Asahi Glass Co Ltd. (JP 10282329 A).

21. In regards to Claim 1, Asahi Glass Co Ltd. teaches a color filter manufacturing method comprising relatively moving a coating head and a member to be coated (Figs. 1 and 2) and further comprising a step of rinsing said coating head by stopping a supply of coating liquid to said coating head after ejecting the coating liquid and making a cleaning liquid flow directly to said coating head to clear the inner portion of the head of dirt and stains (Abstract and Figure 1). Specifically, Asahi Glass Co Ltd. teaches discharging ink onto a substrate using a coating head, using a switching device (e.g., a valve) to change the flow path to the coating head, and pumping cleaning liquid through the inner portion of the coating head.

22. Asahi Glass Co Ltd. teaches all the limitations of Claim 2 as set forth in paragraph 21, including a method comprising a step of supplying the cleaning liquid

intermittently to the coating head. Specifically, Asahi Glass Co Ltd. teaches a method that ensures effective mass production of color filters since the inkjet head can be easily cleaned after each manufacturing process (i.e., intermittently).

23. Claims 1 and 2 are rejected under 35 U.S.C. 102(b) as being anticipated by Maneke et al. (USPN 4,704,308).

24. In regards to Claim 1, Maneke teaches a coating method of ejecting a coating liquid (i.e., glue) over the surface of a member to be coated comprising relatively moving a coating head (i.e., a nozzle unit) and the member to be coated (Col.1, lines 8 – 15) and further comprising a step of rinsing said coating head by stopping a supply of the coating liquid to the coating head and making a rinsing liquid flow directly to said coating head. Specifically, Maneke teaches that, when the gluing apparatus is shut down for a prolonged period of time, a purge fluid is introduced into the nozzle unit to purge the glue therefrom so that the glue applicator will be in condition for operation when the apparatus is started again (Col.4, lines 10 – 41).

25. Maneke teaches all the limitations of Claim 2 as set forth in paragraph 24, including a method further comprising the step of supplying the purge fluid intermittently to the coating head. Specifically, Maneke teaches that this cleaning operation is performed whenever the apparatus is shut down for a prolonged period of time (Col.4, lines 10 – 35).

26. Claims 1 and 2 are rejected under 35 U.S.C. 102(b) as being anticipated by Henninger (USPN 4,560,584).

27. In regards to Claim 1, Henninger teaches a coating method of ejecting a coating liquid (i.e., a solder resist material) over the surface of a member to be coated (i.e., a printed circuit board) comprising relatively moving a coating head (i.e., a solder gun and tip) and the member to be coated (Col.3, lines 19 - 27) and further comprising a step of rinsing said coating head by stopping a supply of the coating liquid to the coating head and making a rinsing liquid flow directly to said coating head. Specifically, Henninger teaches that, when the system is shut down for a period of time, the solder resist material may congeal on the tip of the gun and restrict it for subsequent operation. Therefore, a liquid such as water is directed onto the tip of the coating head to remove the congealed solder resist material (Col.3, lines 49 – 67).

28. Henninger teaches all the limitations of Claim 2 as set forth in paragraph 27, including a method further comprising the step of supplying the rinsing liquid intermittently to the coating head. Specifically, Henninger teaches that this cleaning operation is performed whenever the apparatus is shut down for a period of time (Col.3, line 53).

29. Claims 1 and 2 are rejected under 35 U.S.C. 102(e) as being anticipated by Poag et al. (USPN 5,958,517).

30. In regards to Claim 1, Poag teaches a coating method of ejecting a coating liquid (i.e., spin-on glass or SOG) over the surface of a substrate to be coated by relatively

moving a coating head and the member to be coated (Col.4, lines 33 – 40), the method comprising a step of cleaning the coating head by stopping a supply of coating liquid to the coating head and making a cleaning liquid flow directly to said coating head. Specifically, Poag teaches that SOG can quickly solidify after exposure to air, especially on the SOG dispense nozzle. If this dried SOG is dispensed onto the substrate, the results can be catastrophic with respect to integrated circuits formed on the substrate. Therefore, the delivery nozzle must be cleaned with some frequency (Cols. 1 – 2). To clean the nozzle and prevent the coating material from solidifying on the nozzle, Poag teaches a method in which a coating supply line and a cleaning fluid supply line are connected to a valve subsystem, and this valve subsystem is connected to a coating head comprising a nozzle supply line and a delivery nozzle (Figure 1 and Col.4, lines 8 – 20). A coating liquid is passed through the coating liquid supply line and the coating head to coat a substrate. The valve subsystem is then controlled to close the coating supply line and open the cleaning fluid supply line. The cleaning fluid is then sent through the cleaning fluid supply line to clean the coating head (Figure 1 and Col.2).

31. Poag teaches all the limitations of Claim 2 as set forth in paragraph 30, including a method further comprising a step of supplying the rinsing liquid trace by trace or intermittently to the coating head. Specifically, Poag teaches that the cleaning step can be performed "either periodically or after a certain number of cycles or upon a certain amount of time of dormancy" (Col.4, lines 41 – 46). In addition, Poag teaches that the "cleaning fluid from the cleaning fluid supply line may be pulsed to provide cleaning agitation and facilitate cleaning of surfaces" (Col.6, lines 51 – 55).

Claim Rejections - 35 USC § 103

32. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

33. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over the applicant's admitted prior art in view of Asahi Glass Co Ltd (JP 10282329 A).

34. In regards to Claim 4, the applicant's admitted prior art teaches a method of manufacturing a color filter comprising the steps of coating a photosensitive resinous composition over a substrate, a step of obtaining a black matrix pattern on the photosensitive resinous composition, and a step of applying colored ink so as to fill in the black matrix pattern gap (pgs. 2 – 3 and Comparative Examples 1 – 5). According to the applicant's admitted prior art, this color filter manufacturing process is carried out using an apparatus such as the one in applicant's Figure 4. In this process, a rinsing liquid is used to clean the coating head of the coating device by replacing the coating liquid in the supply tank with a rinsing liquid and flushing the coating liquid out of the entire system using the rinsing liquid (Comparative Examples 3 – 4). This process is necessarily time consuming since the coating liquid in the supply tank must be completely replaced by the rinsing liquid, and the entire system must be flushed to remove all the residual coating liquid. The applicant's admitted prior art does not teach that the rinsing liquid is supplied directly to the coating head or to a point midway of a

coating liquid supply path extending to the coating head. Asahi Glass Co Ltd. teaches that, in the manufacture of color filters, the rinsing liquid can be supplied directly to the coating head as set forth in paragraph 21. Because the rinsing liquid can be supplied directly to the coating head after each manufacturing process, effective mass production of color filters can be obtained (Advantage). Therefore, it would have been obvious to one of ordinary skill in the art to use the coating head cleaning process taught by Asahi Glass Co Ltd. in the step of coating a photosensitive resin onto a substrate to produce a color filter as taught by the applicant's admitted prior art with the reasonable expectation of reducing the production time of the color filters.

35. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over the applicant's disclosure in view of Poag et al. (USPN 5,958,517).

36. The applicant's admitted prior art teaches all the limitations of Claim 4 as set forth in paragraph 34 except a method in which the rinsing liquid is supplied directly to the coating head or to a point midway of a coating liquid supply path extending to the coating head during the step of coating a photosensitive resinous composition over a substrate. As set forth in paragraphs 30 – 31, Poag teaches a coating head cleaning method in which the cleaning fluid is supplied directly to a coating head. In both the applicant's admitted prior art and in Poag, there is a concern for cleaning the coating heads to free them from dried coating material so that product quality can be improved. However, the cleaning system of Poag comprises a valve system so that cleaning fluid can be supplied to the coating head quickly, efficiently, and at any time deemed necessary. The applicant's disclosed prior art teaches a time consuming method of

replacing the coating liquid in the supply tank with a rinsing liquid and flushing the coating liquid out of the entire system using the rinsing liquid (Comparative Examples 3 – 4). Therefore, it would have been obvious to one of ordinary skill in the art to substitute the cleaning process of Poag for the cleaning process taught in the applicant's disclosed prior art with the reasonable expectation of successfully cleaning the coating head as required in the prior art and reaping the benefit of a more efficient process.

Conclusion

37. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Schoen (USPN 4,708,452), Yamaguchi et al. (USPN 6,090,216), Eronen (USPN 5,679,408), and Nakayama (USPNs 4,867,345 and 5,261,566) teach methods of cleaning or rinsing various coating heads relevant to Claims 1 and 2. Iwata et al. (USPNs 5,817,441 and 6,042,974), Suzuki et al. (USPN 5,888,679), and Shiba et al. (USPN 5,716,740) teach color filter production methods relevant to Claim 4.

38. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wesley D Markham whose telephone number is (703) 308-7557. The examiner can normally be reached on Monday - Friday, 7:30 AM to 4:30 PM.

39. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shrive Beck can be reached on (703) 308-2333. The fax phone numbers

for the organization where this application or proceeding is assigned are (703) 305-5408 for regular communications and (703) 305-3599 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Wesley D Markham
Examiner
Art Unit 1762

WDM
March 28, 2001

Shrive Beck
Supervisory Patent Examiner
Technology Center 1700